Population dynamics of caterpillars on three cover crops before sowing cotton in Mato Grosso (Brazil)

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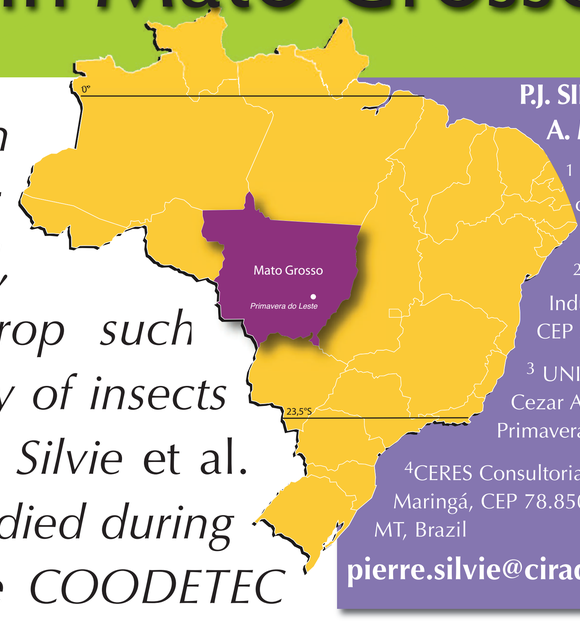


DIRECT seeding mulch-based cropping systems have been highly developed in Brazil (Séguy et al., *1996). Single- or multi-species cover crops are sown after the first rains fall, dried by herbicide treatments prior to sowing a main crop such as cotton. The main crop is directly seeded into the mulch. The biology of insects living on these cover crops has seldom been studied (Cividanes, 2002; Silvie* et al. *2005). Dynamics of caterpillar populations on three cover crops was studied during the 2005/2006 and 2006/2007 seasons at the research station of the COODETEC cooperative at Primavera do Leste, located in Mato Grosso state, in Brazil.*

Methods

A linear pattern was used (Fig. 1).

Three cover crops (Poaceae) were monitored with the help of a wooden frame (1 m²):

- **Cover 1 (M):** pearl millet *(Pennisetum glaucum)*
- **Cover 2 (E):** finger millet *(Eleusine coracana)*
- **Cover 3 (S + B):** ruzigrass *(Brachiaria ruziziensis)*, in association with sorghum.

Wooden frame (1 m²) on *Brachiaria*.

Bare pupae of *S. frugiperda*.

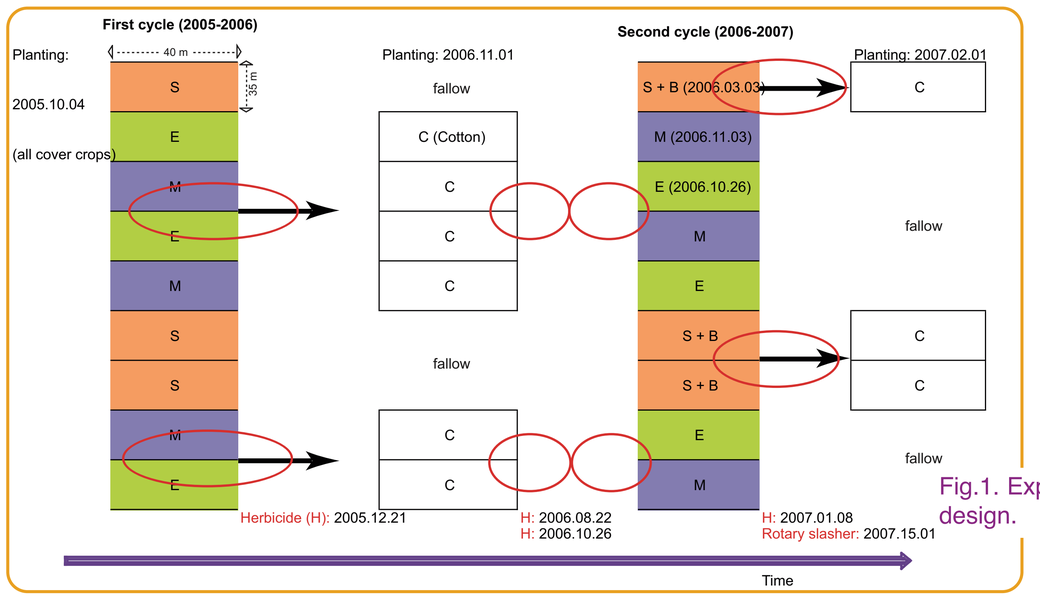


Fig.1. Experimental design.

Results and conclusions

S. frugiperda caterpillars were found on all cover crops with mean population around 37 caterpillars/m² on pearl millet (fig. 2). On the sorghum, it was noted at lower densities in March 2006 (fig. 3). *Diatraea saccharalis* was only found on sorghum (fig. 4) as was *Spodoptera eridania* in 2006 at densities lower than 1 larva/m² (fig. 5). *Mocis latipes* was observed on finger millet *(E. coracana),* and on pearl millet (fig. 6). Parasitoids (Braconidae) were observed on *M. latipes*.

Caterpillars were collected on low plants growing under the herbicide-dried cover crops.

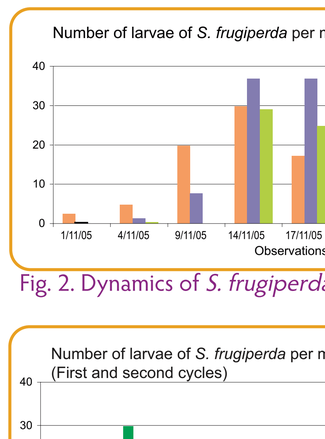


Fig. 2. Dynamics of *S. frugiperda* on cover crops in 2005.

Damage of *S. frugiperda*.

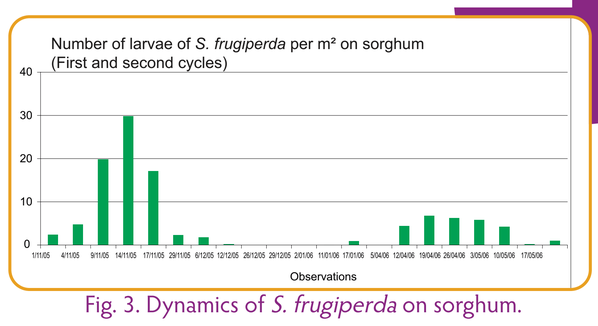


Fig. 3. Dynamics of *S. frugiperda* on sorghum.

Caterpillar of *Spodoptera frugiperda*.

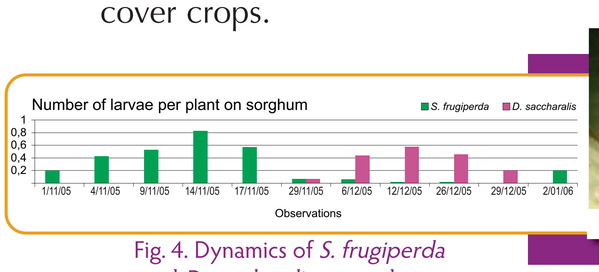


Fig. 4. Dynamics of *S. frugiperda* and *D. saccharalis* on sorghum.

Caterpillar of *Diatraea saccharalis*.

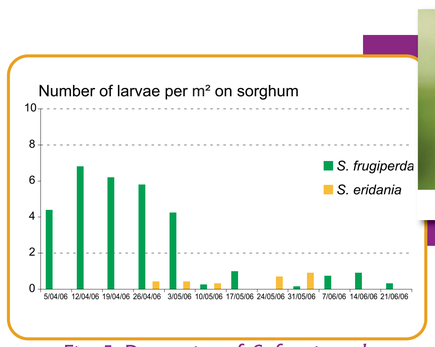
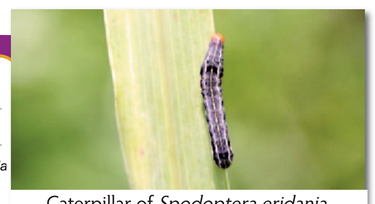


Fig. 5. Dynamics of *S. frugiperda* and *S. eridania* on sorghum (2006).



Caterpillar of *Spodoptera eridania*.

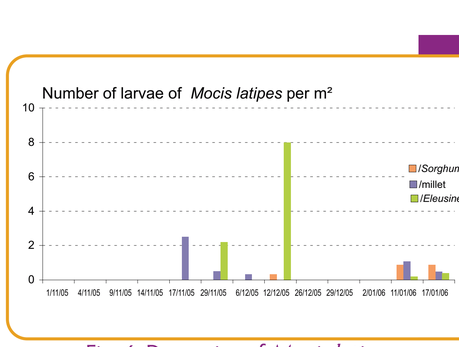
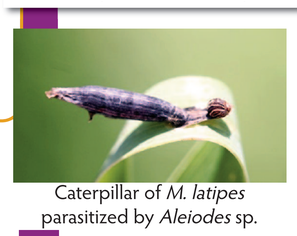


Fig. 6. Dynamics of *Mocis latipes* on cover crops.

Caterpillar of *Mocis latipes*.



Caterpillar of *M. latipes* parasitized by *Aleiodes* sp.

Cocoons of Braconidae (? *Microplitis* sp.) on *M. latipes*.

The recommendation is that cotton should be sown at least one month after the herbicide spray on dry mulch formed by the residue from dried cover crops.

For future works, problems have to be solved with this type of assessment:

- uniform soil coverage;
- access to the same height or even biomass for the lepidopteran adults, sowing dates have to be adjusted.

pearl millet

Non uniform coverage of pearl millet (left) and finger millet (right) on 2005-10-31.

finger millet

Difference of height and biomass between finger millet (left) and pearl millet (right) on 2005-11-21.

References

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